


**NIOT Vibracore Data
for
Sethusamudram Shipping Channel**



NATIONAL INSTITUTE OF OCEAN TECHNOLOGY

GEOTECHNICAL DIVISION

CHENNAI

Project: SETHU SAMUDRA CHANNEL PROJECT

VIBRO CORE SAMPLES										SUMMARY OF LABORATORY TEST RESULTS													
Vibro Core No	Latitude	Longitude	Water depth (m)	Depth (m)	Description	N.M.C (%)	Specific Gravity G _s	γ _s (g/cc)	γ _e (g/cc)	Void Ratio (e)	Degree of Saturation (S _a)	Atterberg Limits			Grain Size Analysis						Torvane (kpa)	Chemical Analysis	
												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
AB-1	09 11 07.05	79 29 13.04	7.0	0.20	Greyish silty medium to fine SAND with broken shells	17	2.67	2.03	1.74	0.53	84.92				4	0	0	29	53	14			
				0.37	Top medium, loose sand, at bottom sand with shell pieces and few pieces of hard rock and coral. Top a thin veneer of loose clayey material.	18		1.84	1.56						10	0	0	49	39	2			
AB-2	09 12 15.05	79 29 13.05	8.9	0.05	Greyish silty medium to fine SAND with broken shells	21		1.99	1.64						7	0	0	27	56	10			
				0.10	- DO -	20		1.95	1.63														
				0.90	Greyish medium to fine SAND with shells	20	2.64	1.83	1.53	0.73	72.77				4	0	0	40	51	5			
				1.80	Top loose sand, bottom semi dense olive grey to grey sand with minor pieces of clayey calcareous sand stones	24	2.64	1.86	1.50	0.76	83.36				5	6	1	29	45	14			

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
AB-3	09 14 8.615	79 29 8.312	9.15	0.0	Greyish silty medium to fine SAND	33	2.65	1.87	1.40	0.89	97.94				3	5	1	25	52	14			
				0.50	Top loose olive grey silty sand, hard and clayey calcareous sand stone at bottom in gravel size										0	29	2	19	32	18			
AB-4	09 11 01.27	79 28 57.13	6.5	0.0	Light greyish medium to fine SAND with shells	20		1.86	1.55						5	0	0	30	58	7			
				0.60	Brownish silty medium to fine SAND	15		1.73	1.50														
				1.26	Top thin veneer of silty clay followed by sandy material, bottom sand with shell pieces partially dense	17	2.68	1.79	1.52	0.76	59.69				3	0	1	37	57	2			
BC-1	09 17 11.65	79 28 33.04	8.4		NO Sample																		
BC-2	09 20 13.6	79 27 47.83	11.9	0.0	Greyish very soft silty CLAY							85	26	59								5.2	1.75
				1.40	Greyish soft clayey silty fine SAND with shells	50	2.71	1.72	1.15	1.36	99.88				7	0	0	10	41	42			
				2.83	Loose olive grey silty clay at top and dark grey firm clay at bottom	28		1.60	1.25			67	34	33								2.3	1.93

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
BC-3	09 15 12.34	79 28 59.08	9.5	0.0	Dark greyish silty fine SAND with shells	31		1.85	1.49						5	3	4	22	53	13			
				0.42	Olive grey medium to fine sand at top with pieces of white sand stone with sand at bottom										0	43	6	17	22	12			
BC-4	09 17 03.50	79 28 29.22	8	0.0	Greyish medium to fine SAND	33	2.68	1.90	1.42	0.89	99.67				3	0	2	39	43	13			
				0.60	Top medium to fine sand with shell pieces. Medium to fine sand at bottom	23	2.72	1.93	1.58	0.72	86.70				3	0	5	34	47	11			
BC-5	09 20 35.32	79 27 38.83	12.12	0.0	Greyish calcarious silty SAND	77	2.66	1.51	0.85	2.13	96.18				18	0	0	3	30	49		6.3	0.67
				1.0	Greyish calcarious clayey silty SAND	43		1.66	1.16						16	0	0	2	38	44			
				2.60	Grey calcareous silty sand	39		1.78	1.28			61	37	24								75	

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Vibro Core No	Latitude	Longitude	Water depth (m)	Depth (m)	Description	N.M.C (%)	Specific Gravity G _s	w (g/cc)	w (g/cc)	Void Ratio (e)	Degree of Saturation (S _r)	Atterberg Limits			Grain Size Analysis						Tonvane (kpa)	Chemical Analysis		
												LL (%)	PL (%)	PI (%)	Ca CO ₃ (%)	Organic Matter (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
BC-6	09 18 20.15	79 28 23.56	10.4	0.0	Greyish silty fine SAND with shells	42		1.68	1.18						5	0	3	17	52	23				
				0.90	In top shell clayey sand to silty sand at bottom calcareous clayey sand stone the sand stone pieces are hard. Since the presence of hard formations are observed the coring was repeated at 16.05 hours were similar results are seen	18									0	28	21	13	19	19				
CD-1	09 26 06.60	79 25 46.05	12.75	0.00	Greyish very soft silty CLAY	190						138	61	77										
				0.40	-DO-	160															1			
				0.60	Dark Greyish very soft CLAY	151		1.29	0.50															
				1.30	-DO-	154	2.53	1.30	0.51	3.96	98.36	120	66	54							5			
				2.00	Top soft olive grey silty clay Bottom at 2.10m compact stiff dark grey blackish clay at 2.0m firm clay	35															55	5.5	0.92	

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
CD-2	09 30 10.01	79 24 07.85	13.36	0.0	Greyish very soft silty CLAY	147	2.59	1.28	0.51	4.08	93.35	125	61	64									
				0.80	Greyish soft silty CLAY	79		1.51	0.84			70	27	43							4		
				1.75	Top loose silty clay with lumps of semi compact clay and piece of small sand stone like material. Bottom olive grey stiff clay	38	2.68	1.85	1.34	1.02	100	62	35	27							112		
CD-3	09 34 49.70	79 22 21.45	13.2	0.10	Greyish very soft silty CLAY	127		1.38	0.60			112	45	67							1	6.5	1.17
				1.0	Greyish very soft CLAY	75	2.63	1.48	0.84	2.13	92.56										7		
				1.95	Top olive grey soft silty clay with shell pieces. Bottom dark green to black compact stiff clay.	50		1.75	1.17			80	38	42							45		
CD-4	09 39 03.82	79 20 47.32	13	0.20	Olive greenish grey very soft silty CLAY	162		1.30	0.49			132	36	96							1		
				1.05	Top semi consolidated olive grey soft clay with shell, bottom dark olive grey firm to stiff clay	42		1.86	1.32												70		

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
CD-5	09 23 04.25	79 27 06.75	12.7	0.0	Greyish very soft silty CLAY	233		1.13	0.34													1	1.1	12.44
				1.35	Greyish very soft CLAY.	72		1.59	0.92			55	30	25								4		
				2.30	Top olive grey soft silty clay, at 1.35m olive grey semi consolidated sandy clay, at bottom olive grey compact and consolidated firm clay	34	2.86	1.87	1.40	0.90	97.53	60	36	24								70		
CD-6	09 35 20.68	79 22 17.12	13.2	0.1	Olive greenish gary very soft CLAY	102		1.45	0.71			80	30	50								1		
				0.90	Olive green sandy CLAY with shells	51	2.65	1.71	1.13	1.35	100				12	0	0	8	20	60	3			
				1.40	Top loose olive grey soft clay at 0.33m semi consolidated sandy clay, bottom dark grey firm clay with shell pieces	41	2.63	1.79	1.26	1.09	99.17	60	37	23								40		
CD-7	09 26 26.54	79 25 31.63	13.0	0.0	Olive green very soft CLAY	155		1.30	0.51			143	33	110										
				1.0	Greyish sandy clayey SILT with broken shells	57		1.61	1.03						2	0	5	6	4	83	4			
				2.0	Top olive grey soft clay, at bottom firm dark grey to blackish clay	40		1.73	1.23			50	24	26								55		

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
CD-8	09 34 46.15	79 22 12.28	13.3	0.10	Olive green very soft sandy silty CLAY	78	2.68	1.51	0.84	2.19	95.43	85	26	59							1	5.1	2.00	
				1.0	Greyish very soft silty CLAY	85		1.52	0.82			75	29	46								5		
				2.0	Top loose olive grey sandy silty clay, at bottom dark olive grey firm clay	48		1.76	1.18			90	41	49								55		
DE-1	09 57 01.81	79 32 23.49	12.7	0.0	Greenish grey very soft CLAY	154		1.24	0.49			132	36	96							1			
				1.50	Greenish grey firm CLAY	121		1.37	0.62			112	32	80								55		
				2.30	Greyish clayey sandy SILT with broken shells	62		1.65	1.01			72	29	43	16	0	0	15	27	42	5			
				3.0	Top olive grey loose soft clay. Bottom olive grey stiff clay	27		1.98	1.56			52	24	28							75			

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
DE-2	09 53 04.72	79 29 27.96	13.31	0.0	Greenish grey very soft Clay	152		1.30	0.52			129	36	93								2.6	1.51
				1.0	Greyish soft CLAY	123		1.38	0.62												5		
				1.95	Top olive grey loose soft clay, at bottom light bisout brown compact stiff clay. Just above this there is somewhat plastic stiff compact white to pale clay with small rock pieces	43	2.62	1.76	1.23	1.13	99.69	87	36	51							50		
DE-3	09 44 04.58	79 22 48.82	12.8	0.10	Olive green very soft silty CLAY	57		2.16	1.37			70	31	39							1		
				0.90	Greyish very soft CLAY	82		1.52	0.83			77	36	41							4		
				1.85	Top loose olive grey to dark olive grey silty clay, bottom dark grey to grey firm clay	55	2.67	1.69	1.08	1.47	99.74	72	35	37							45		

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
DE-4	09 48 44.89	79 24 37.42	13.0	0.0	Greenish grey very soft CLAY	245		1.21	0.35			126	34	92							1	5.3	2.34
				0.80	Greenish grey very soft CLAY	102	2.45	1.41	0.70	2.50	99.96	97	29	68							6		
				1.60	Top olive grey loose, at bottom dark grey to black clay, firm	46		1.70	1.16												60	3.4	0.92
DE-5	09 42 51.27	79 21 42.17	13.5	0.0	Greyish very soft Clay	107						108	31	77									
				0.60	Greyish very soft CLAY	97		1.46	0.74												6		
				1.35	Top olive grey soft clay, bottom dark grey to black firm clay	39	2.64	1.78	1.28	1.06	96.90	52	22	30							30		
DE-6	09 41 10.26	79 20 28.31	12.5	0.00	Greenish very soft CLAY	170		1.23	0.45			114	33	81							1		
				0.75	Bottom core recovered 0.75m. Top loose olive grey soft clay with minor shells, at bottom dark olive grey firm silty clay with minor pieces of shells	49		1.67	1.12												55		

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
DE-7	09 49 01.28	79 26 06.57	13.12	0.00	Olive green very soft silty CLAY	210		1.22	0.39														1.7	3.02
				1.35	Greyish very soft silty CLAY	117		1.35	0.62			112	34	78								5		
				2.60	Top olive grey loose with minor crumbling shell pieces at 1.30m olive grey semi consolidated slightly plastic clay. Bottom olive grey sticky firm clay. This is not as stiff as earlier samples, it is more plastic	52		1.61	1.05												35			
DE-8	09 45 06.60	79 23 40.20	12.9	0.0	Olive green very soft silty CLAY	238		1.18	0.35			122	36	86								1		
				0.90	Greenish grey very soft CLAY	109	2.55	1.40	0.67	2.81	99.05	85	38	47								4		
				1.85	Top olive grey loose silty clay bottom dark olive grey to olive brown sticky firm clay	49		1.74	1.16			72	40	32								60		

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
DE-9	09 42 30.13	79 21 49.94	12.6	0.0	Greenish grey very soft CLAY	134	2.51	1.33	0.56	3.48	96.58	106	37	69							1			
				0.75	Greyish very soft CLAY	87	2.71	1.50	0.80	2.39	98.75											2		
				1.45	Top loose olive grey silty clay at 75 cm soft clay, bottom dark grey to black firm clay	51		1.69	1.12													60		
DE-10	09 44 21.26	79 23 20.60	13.36	0.00	Greenish grey very soft CLAY	185		1.20	0.40													7.2	1.50	
				0.90	Greyish very soft CLAY	109		1.41	0.67													5		
				1.80	Loose olive grey soft clay, bottom sticky dark grey to dark firm clay	52	2.73	1.70	1.12	1.44	98.75	47	23	24								50		
DE-11	09 51 59.40	79 29 03.55	12.6	0.00	Olive green very soft CLAY	185		1.19	0.40			77	28	49										
				1.06	Greyish very soft silty CLAY	113		1.39	0.65			106	39	67								3		
				2.0	Top loose olive grey soft clay, with some shells, at bottom olive grey somewhat plastic firm clay.	50	2.7	1.72	1.14	1.37	98.65	111	46	65								65		

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
E-E ₁ -1	10 08 25.03	80 02 58.14	10.5	0.20	Greyish soft silty fine sandy CLAY	36	2.69	1.85	1.36	0.98	99.02	37	22	15	4	0	0	8	37	51		4.0	0.25
				1.15	Greyish soft silty CLAY	45		1.70	1.17			50	22	28									
				2.25	Top olive loose sandy clay pieces minor shells. At 2.25m light grey to cement colour sand clay the small pieces of sand stone. Core barrel bottom white to half white semi plastic sand to silty clay	17	2.62								0	20	10	18	16	36		6.9	0.08
E-E ₂ -2	10 05 55.06	79 55 37.51	7	0.26	Brownish medium to fine SAND	20		1.94	1.61						1	0	0	32	66	1			
				1.31	Top light brown medium to fine sand along with some fine black sand with pieces of shells. At bottom white to half white medium to fine sand. The sand appears loose and is probably at depth due to which not much penetration	18	2.69	1.88	1.59						1	0	0	15	76	8			

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
E-E ₁ -3a	10 01 45.20	79 43 22.59	12	0.20	Greyish very soft fine sandy CLAY with shells	54	2.69	1.52	0.98	1.74	83.24	60	22	38	10	0	0	3	17	70		4.4	1.17	
				1.37	Top grey soft sand clay. At bottom light colour plastic clay silty to silty clay with pieces of white calcareous sand stone. Since the top is initially 11.59m and there are presence of calcareous sand stone it was decided to take another vibro core here.	25		1.95	1.56						1	0	3	7	60	29				
E-E ₁ -3b	10 01 45.68	79 43 21.05	12.1	0.20	Greyish very soft silty CLAY with broken shells	38		1.83	1.34			32	NP								6	3.2	0.34	
				1.47	Same as 3A. The calcareous sand stone is initially bit soft and clayey. This shows from around 11.60m it is lightly hard.	23	2.65	2.01	1.64	0.62	98.98	30	NP											

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												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)		Silt & Clay (%)	Ca CO ₃ (%)	Organic Matter (%)
E-E ₄ -4	10 0 09.27	79 38 30.06	11.8	0.00	Greyish very soft CLAY	76		1.34	0.76			75	26	49									
				0.75	Greyish very soft CLAY	47		1.86	1.40														
				1.45	Top olive grey loose soft clay with small shells at 1.40m stiff plastic sticky compact olive grey clay. At bottom lighty straw to very light brown compact sandy silty firm clay	29		1.85	1.43					1	2	2	2	33	60	50			
E-E ₄ -5	09 59 52.2	79 38 48.30	11.6	0.0	Greyish very soft silty CLAY	54	2.29	1.54	1.0	1.29	95.66	67	29	38							2		
				1.0	Top loose olive grey silty clay with minor plastic clayey pieces and shells. At bottom olive grey firm clay	34		1.79	1.33			87	43	44							65		

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VIBRO CORE SAMPLES										SUMMARY OF LABORATORY TEST RESULTS														
Vibro Core No	Latitude	Longitude	Water depth (m)	Depth (m)	Description	N.M.C (%)	Specific Gravity G_s	γ_w (g/cc)	γ_s (g/cc)	Void Ratio (e)	Degree of Saturation (S _a)	Atterberg Limits			Grain Size Analysis						Tonvane (kpa)	Chemical Analysis		
												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
E-E ₄ -6	06 59 8.25	79 36 16.08	12.0	0.0	Greyish soft CLAY with fine sand							96	27	69										
				0.3		58	2.56	1.44	0.91	1.81	81.88										4			
				1.5	Greyish clay with broken shells	30		1.85	1.43			35	19	16										
				3.0	Top olive grey loose soft clay at 30cm semi consolidated olive grey silty clay at 1.50m olive grey clay with lot of broken shells. At bottom light straw coloured to light bisout colour Compact stiff clay	33	2.33	1.76	1.33	0.75	99.16	94	51	43							80			
E-E ₄ -7a	10 06 10.40	79 56 47.00	8.8	0.00	Brownish silty fine to medium SAND	20		1.90	1.58						3	0	0	34	21	42				
				1.30	Top straw yellow to brown medium to fine sand. Bottom near core catcher cement colour medium to fine sand and sand stone pieces	19	2.63	2.0	1.68	0.57	88.36				0	1	0	26	44	29				

Project: SETHU SAMUDRA CHANNEL PROJECT

VIBRO CORE SAMPLES										SUMMARY OF LABORATORY TEST RESULTS														
Vibro Core No	Latitude	Longitude	Water depth (m)	Depth (m)	Description	N.M.C (%)	Specific Gravity G _s	γ _w (g/cc)	γ _s (g/cc)	Void Ratio (e)	Degree of Saturation (S _a)	Atterberg Limits			Grain Size Analysis						Torvane (kpa)	Chemical Analysis		
												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)	
E-E ₄ -6	06 59 8.25	79 36 16.08	12.0	0.0	Greyish soft CLAY with fine sand							96	27	69										
				0.3		58	2.56	1.44	0.91	1.81	81.88										4	6.6	1.84	
				1.5	Greyish clay with broken shells	30		1.85	1.43			35	19	16										
				3.0	Top olive grey loose soft clay at 30cm semi consolidated olive grey silty clay at 1.50m olive grey clay with lot of broken shells. At bottom light straw coloured to light biscuit colour Compact stiff clay	33	2.33	1.76	1.33	0.75	99.16	94	51	43						80				
E-E ₄ -7a	10 06 10.40	79 56 47.00	8.8	0.00	Brownish silty fine to medium SAND	20		1.90	1.58						3	0	0	34	21	42				
				1.30	Top straw yellow to brown medium to fine sand. Bottom near core catcher cement colour medium to fine sand and sand stone pieces	19	2.63	2.0	1.68	0.57	88.36				0	1	0	26	44	29				

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VIBRO CORE SAMPLES										SUMMARY OF LABORATORY TEST RESULTS													
Vibro Core No	Latitude	Longitude	Water depth (m)	Depth (m)	Description	N.M.C. (%)	Specific Gravity G _s	w ₁ (g/cc)	w ₀ (g/cc)	Void Ratio (e)	Degree of Saturation (S _r)	Atterberg Limits			Grain Size Analysis						Tonnage (kpa)	Chemical Analysis	
												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
E-E ₄ -10	10 08 04.14	79 55 31.67	8.5	0.0	Brownish medium to fine SAND with shells	4	2.72	1.41	1.35	1.01	10.72				2	0	0	39	57	2			
				1.07	Brownish medium to fine SAND	14		1.78	1.56						1	0	0	17	79	3			
				2.00	Top straw yellow to light brown medium to fine sand. At 2.07 m cement colour medium clayey sand at the bottom of the core barrel light calcareous medium sand with more fine sand and shell pieces and clay.	21		2.02	1.67						1	0	0	9	88	2			
E-E ₄ -11	10 04 08.62	79 49 34.70	10.0	0.00	Olive green very soft CLAY	68		1.55	0.92			51	27	24							2	2.0	12.02
				1.00	Top olive grey soft clay with shell pieces. Between 1.05 and 1.08 olive grey sticky clayey silt, at bottom olive, grey silty sand with shells.	29		1.88	1.46						2	0	0	0	55	43			

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VIBRO CORE SAMPLES										SUMMARY OF LABORATORY TEST RESULTS													
Vibro Core No	Latitude	Longitude	Water depth (m)	Depth (m)	Description	N.M.C (%)	Specific Gravity G_s	γ_w (g/cc)	γ_s (g/cc)	Void Ratio (e)	Degree of Saturation (%)	Atterberg Limits			Grain Size Analysis						Torvane (kpa)	Chemical Analysis	
												LL (%)	PL (%)	PI (%)	Shells (%)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt & Clay (%)		Ca CO ₃ (%)	Organic Matter (%)
E-E ₁ -12	10 05 26.07	79 53 57.42	10.0	0.00	Greenish grey clayey silty fine SAND with shells	38									3	0	0	1	56	40			
				0.90	Top grey silty sand. At bottom to the core linear fine olive grey fine silty sand just below end of the core barrel olive grey to fine sand to silty sand	21	2.64	2.05	1.69	0.56	98.62				5	0	0	3	72	20			
E-E ₁ -13	10 07 09.60	79 50 06.69	9.8	0.0	Greyish soft clayey SILT	33	2.7	1.81	1.36	0.99	90.42	34	NP									2.5	0.17
				1.60	Olive green Calcareous SAND STONE peaces	14	2.67	1.58	1.39	0.92	40.59												
				1.67	Top grey loose clayey silty to silty clay at 1.67m olive grey medium clayey sand with pieces to calcareous sand stone and shells										0	26	7	25	23	19			

Note: Water depth are measured during operation time